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Polymers for use in controlled release systems: the effect of surfactants on their swelling properties.

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Abstract

The effect of an ampholytic surfactant on the swelling properties of polymeric materials was studied, using various swelling liquids. Tablets were prepared consisting of hydroxypropyl methylcellulose, poly(oxyethylene) and sodium alginate. Tego betain was the non-ionic surfactant used as an additive in a series of samples made of the above polymers. Those tablets were immersed in distilled water, phosphate buffer and 0.1 N HCl, and their weight uptake was recorded as a function of time, in order to assess the swelling process. Measurements of the contact angle of the above systems were also carried out for estimating their wetting properties. The results of this study showed a selectivity among polymers, surfactant and surrounding liquid. Clearly, an enhancement of the swelling capacity of hydroxypropyl methylcellulose tablets due to the surfactant was recorded. An unclear effect was observed in the case of poly(oxyethylene), whereas for sodium alginate, the dominant factor is its water solubility that controls swelling behaviour.